

IN THE DRAWINGS:

The attached sheets of drawings include changes to FIG. 6. This sheet, which includes FIG. 6, replaces the previous drawing sheet, including FIG. 6. In FIG. 6, previously omitted at least one opening 226 of the substrate 220 of the at least one semiconductor assembly extending proximate more than one side of a periphery of the substrate 220 has been illustrated by the dashed lines extending from one opening 226 proximate one side 220 of the periphery of the substrate to another opening 226 proximate another side of the periphery of the substrate 220. (See attached Replacement Sheet and Annotated Sheet Showing Changes.)

REMARKS

This is in response to the Final Rejection in the Office Action mailed February 1, 2006

Claims 1 through 24 are currently pending in the application.

Claims 1 through 24 stand rejected.

The amendment to specification paragraph numbered [0041] has been made to describe the subject matter of dependent claim 17 as such paragraph taken in conjunction with drawing FIG. 6 describes the subject matter of dependent claim 16.

35 U.S.C. § 112 Claim Rejections

Claims 16 though 18 stand rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Applicant respectfully traverses this rejection, as hereinafter set forth.

Applicant asserts that presently amended independent claims 16 and 17 as well as dependent claim 18 therefrom clearly comply with the provisions of 35 U.S.C. § 112, second paragraph, as the subject matter is clearly illustrated in the corrected drawing FIG. 6 as particularly pointing out and distinctly claiming the subject matter which applicant regards as the invention.

Applicant asserts that the amendment to specification paragraph numbered [0041] clearly complies with the provisions of 35 U.S.C. § 132 as no new matter has been added to the disclosure.

35 U.S.C. § 103(a) Obviousness Rejections

Obviousness Rejection Based on U.S. Patent 5,917,242 to Ball

Claims 1 through 10, 14, and 19 through 24 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Ball (U.S. Patent 5,917,242). Applicant respectfully traverses this rejection, as hereinafter set forth.

M.P.E.P. 706.02(j) sets forth the standard for a Section 103(a) rejection:

To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references

themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or combine reference teachings. Second, there must be a reasonable expectation of success. Finally, **the prior art reference (or references when combined) must teach or suggest all the claim limitations.** The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant's disclosure. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991). (Emphasis added).

Applicant asserts that the cited prior art does not establish a *prima facie* case of obviousness under 35 U.S.C. § 103 regarding the claimed inventions of presently amended independent claims 1, 19, 22, 23, and 24 because, at the least, the cited prior art does not teach or suggest all the claim limitations.

Turning to the cited prior art, the Ball reference teaches or suggests one or more semiconductor die attached to portions of a substrate having electrical connections thereto using solder bumps and bond wires.

Applicant asserts that the Ball reference does not establish a *prima facie* case of obviousness under 35 U.S.C. § 103 regarding the claimed inventions of presently amended independent claims 1, 19, 22, 23, and 24 because the Ball reference does not teach or suggest the claim limitations calling for “a substrate having a first surface, a second surface and at least one substantially centrally located opening therethrough, the at least one substantially centrally located opening in the substrate extending from the first surface to the second surface of the substrate”, and “a plurality of bond wires extending through the at least one substantially centrally located opening in the substrate and bonded from the active surface of the semiconductor die to the second surface of the substrate”. Applicant asserts that, in contrast to the claimed inventions of presently amended independent claims 1, 19, 22, 23, and 24, the Ball reference contains no teaching or suggestion whatsoever as to the location of any opening for any substrate described therein. Therefore, presently amended independent claims 1, 19, 22, 23, and 24 are allowable as well as the dependent claims therefrom.

While the Office Action makes asserts that the location of the openings are obvious to a person of ordinary skill in the art, Applicant asserts that such a general assertion cannot establish a *prima facie* case of obviousness under 35 U.S.C. § 103 because no showing has been made as to “both the scope and content of the prior art” and “level of ordinary skill in the pertinent art”.

aspects of the *Graham* test, there has been no explanation of the motivation, or the suggestion or teaching that would have led the skill artisan at the time of the invention to the invention, as a whole showing that hindsight was used to conclude that the invention was obvious, and without an explanation of the motivation, suggestion, or teaching as part of the *prima facie* case of obviousness of the claimed invention under 35 U.S.C. § 103, solely hindsight has been used. *In re Kahn*, Fed.Cir. No. 04-1616, 3/22/06, 71USPQ2d 1763 (Fed. Cir. 2006)..

The nonobviousness of independent claims 1, 19, 22, 23, and 24 precludes a rejection of claims 2 through 15, 17, 20, and 21 which depend therefrom because a dependent claim is obvious only if the independent claim from which it depends is obvious. *See In re Fine*, 5 U.S.P.Q.2d 1596, 1600 (Fed. Cir. 1988), *see also* MPEP § 2143.03. Therefore, the Applicant requests that the Examiner withdraw the 35 U.S.C. § 103(a) obviousness rejection to independent claims 1, 19, 22, 23, and 24 and claims 2 through 15, 17, 20, and 21 which depend therefrom.

Obviousness Rejection Based on U.S. Patent 5,917,242 to Ball in View of U.S. Patent 5,744,383 to Fritz

Claims 11 and 12 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Ball (U.S. Patent 5,917,242) as applied above for claim 1, and further in view of Fritz (U.S. Patent 5,744,383). Applicant respectfully traverses this rejection, as hereinafter set forth.

Applicant asserts that any combination of the cited prior art does not establish a *prima facie* case of obviousness under 35 U.S.C. § 103 regarding the claimed inventions of presently amended independent claims 1 and dependent claims 11 and 12 therefrom because, at the least, any combination of the cited prior art does not teach or suggest all the claim limitations.

Turning to the cited prior art, the Ball reference teaches or suggests one or more semiconductor die attached to portions of a substrate having electrical connections thereto using solder bumps and bond wires.

The Fritz reference teaches or suggests a semiconductor device using a carrier such as a TAB carrier.

Applicant asserts that any combination of the Ball reference and the Fritz reference does not establish a *prima facie* case of obviousness under 35 U.S.C. § 103 regarding the claimed inventions of presently amended independent claim 1 because the Ball reference does not teach

or suggest the claim limitations calling for “a substrate having a first surface, a second surface and at least one substantially centrally located opening therethrough, the at least one substantially centrally located opening in the substrate extending from the first surface to the second surface of the substrate”, and “a plurality of bond wires extending through the at least one substantially centrally located opening in the substrate and bonded from the active surface of the semiconductor die to the second surface of the substrate”. Applicant asserts that, in contrast to the claimed invention of presently amended independent claim 1 neither the Ball reference nor the Fritz reference nor any combination of the Ball reference and the Fritz reference contains any teaching or suggestion whatsoever as to the location of any opening for any substrate described therein. Therefore, presently amended independent claim 1 is allowable as well as the dependent claims 11 and 12 therefrom.

The nonobviousness of independent claim 1 precludes a rejection of claims 11 and 12 which depend therefrom because a dependent claim is obvious only if the independent claim from which it depends is obvious. *See In re Fine*, 5 U.S.P.Q.2d 1596, 1600 (Fed. Cir. 1988), *see also* MPEP § 2143.03. Therefore, the Applicant requests that the Examiner withdraw the 35 U.S.C. § 103(a) obviousness rejection to independent claim 1 and claims 11 and 12 which depend therefrom.

Obviousness Rejection Based on U.S. Patent 5,917,242 to Ball in View of U.S. Patent 5,744,383 to Fritz, and Further in View of U.S. Patent 6,228,679 to Chiu

Claim 13 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Ball (U.S. Patent No. 5,917,242) in view of Fritz (U.S. Patent No. 5,744,383) as applied for claim 12, and further in view of Chiu (U.S. Patent No. 6,228,679). Applicant respectfully traverses this rejection, as hereinafter set forth.

Applicant asserts that any combination of the cited prior art does not establish a *prima facie* case of obviousness under 35 U.S.C. § 103 regarding the claimed inventions of presently amended independent claims 1 and dependent claim 13 therefrom because, at the least, any combination of the cited prior art does not teach or suggest all the claim limitations.

Turning to the cited prior art, the Ball reference teaches or suggests one or more semiconductor die attached to portions of a substrate having electrical connections thereto using solder bumps and bond wires.

The Fritz reference teaches or suggests a semiconductor device using a carrier such a TAB carrier.

The Chiu reference teaches or suggests an underfill material between the semiconductor die and a substrate.

Applicant asserts that any combination of the Ball reference, the Fritz reference, and the Chiu reference does not establish a *prima facie* case of obviousness under 35 U.S.C. § 103 regarding the claimed inventions of presently amended independent claim 1 because any combination of the Ball reference, the Fritz reference, and the Chiu reference does not teach or suggest the claim limitations calling for “a substrate having a first surface, a second surface and at least one substantially centrally located opening therethrough, the at least one substantially centrally located opening in the substrate extending from the first surface to the second surface of the substrate”, and “a plurality of bond wires extending through the at least one substantially centrally located opening in the substrate and bonded from the active surface of the semiconductor die to the second surface of the substrate”. Applicant asserts that, in contrast to the claimed invention of presently amended independent claim 1 neither the Ball reference nor the Fritz reference nor the Chiu reference nor any combination of the Ball reference and the Fritz reference and the Chiu reference contains any teaching or suggestion whatsoever as to the location of any opening for any substrate described therein. Therefore, presently amended independent claim 1 is allowable as well as the dependent claim 13 therefrom.

The nonobviousness of independent claim 1 precludes a rejection of claim 13 which depends therefrom because a dependent claim is obvious only if the independent claim from which it depends is obvious. *See In re Fine*, 5 U.S.P.Q.2d 1596, 1600 (Fed. Cir. 1988), *see also* MPEP § 2143.03. Therefore, the Applicant requests that the Examiner withdraw the 35 U.S.C. § 103(a) obviousness rejection to independent claim 1 and claim 13 depends therefrom.

Obviousness Rejection Based on U.S. Patent 5,917,242 to Ball in View of U.S. Patent 5,744,383 to Fritz, and Further in View of U.S. Patent 6,011,307 to Jiang

Claim 15 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Ball (U.S. Patent 5,917,242) in view of Fritz (U.S. Patent 5,744,383), and further in view of Jiang (U.S. Patent 6,011,307). Applicant respectfully traverses this rejection, as hereinafter set forth.

Applicant asserts that any combination of the cited prior art does not establish a *prima facie* case of obviousness under 35 U.S.C. § 103 regarding the claimed inventions of presently amended independent claims 1 and dependent claim 15 therefrom because, at the least, any combination of the cited prior art does not teach or suggest all the claim limitations.

Turning to the cited prior art, the Ball reference teaches or suggests one or more semiconductor die attached to portions of a substrate having electrical connections thereto using solder bumps and bond wires.

The Fritz reference teaches or suggests a semiconductor device using a carrier such as a TAB carrier.

The Jiang reference teaches or suggests mirrored connection bond pads for a semiconductor die.

Applicant asserts that any combination of the Ball reference, the Fritz reference, and the Jiang reference does not establish a *prima facie* case of obviousness under 35 U.S.C. § 103 regarding the claimed inventions of presently amended independent claim 1 because any combination of the Ball reference, the Fritz reference, and the Jiang reference does not teach or suggest the claim limitations calling for “a substrate having a first surface, a second surface and at least one substantially centrally located opening therethrough, the at least one substantially centrally located opening in the substrate extending from the first surface to the second surface of the substrate”, and “a plurality of bond wires extending through the at least one substantially centrally located opening in the substrate and bonded from the active surface of the semiconductor die to the second surface of the substrate”. Applicant asserts that, in contrast to the claimed invention of presently amended independent claim 1 neither the Ball reference nor the Fritz reference nor the Jiang reference nor any combination of the Ball reference and the Fritz reference and the Jiang reference contains any teaching or suggestion whatsoever as to the location of any opening for any substrate described therein. Therefore, presently amended

independent claim 1 is allowable as well as the dependent claim 15 therefrom.

The nonobviousness of independent claim 1 precludes a rejection of claim 15 which depends therefrom because a dependent claim is obvious only if the independent claim from which it depends is obvious. *See In re Fine*, 5 U.S.P.Q.2d 1596, 1600 (Fed. Cir. 1988), *see also* MPEP § 2143.03. Therefore, the Applicant requests that the Examiner withdraw the 35 U.S.C. § 103(a) obviousness rejection to independent claim 1 and claim 15 depends therefrom.

Applicant requests entry of this amendment for the following reasons:

The amendment places the application in condition for allowance.

The amendment does not require any further search or consideration as claims 16 and 17 have been amendment herein to merely place such claims in independent form to comply with the provisions of 35 U.S.C. § 112, second paragraph.

The amendment is timely filed.

ENTRY OF AMENDMENTS

The amendments to claims 16 and 17 above should be entered by the Examiner because the amendments are supported by the as-filed specification and drawings and do not add any new matter to the application to clearly comply with the provisions of 35 U.S.C. § 132. Further, the amendments do not raise new issues or require a further search as the claims are merely rewritten in independent form to comply with the provisions of 35 U.S.C. § 112, second paragraph.

CONCLUSION

Claims 1 through 24 are believed to be in condition for allowance, and an early notice thereof is respectfully solicited. Should the Examiner determine that additional issues remain which might be resolved by a telephone conference, he is respectfully invited to contact Applicant's undersigned attorney.

Respectfully submitted,



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JRD/nj:lmh

Attachments: Replacement Drawing Sheet
Annotated Sheet Showing Changes

Document in ProLaw

TITLE: BUMPED DIE AND WIRE
BONDED BOARD-ON-CHIP PACKAGE
Inventor: Larry D.Kinsman
Serial No. 10/792,229
Docket No. 2269-4585.3US
ANNOTATE SHEET SHOWING
CHANGES



4/6

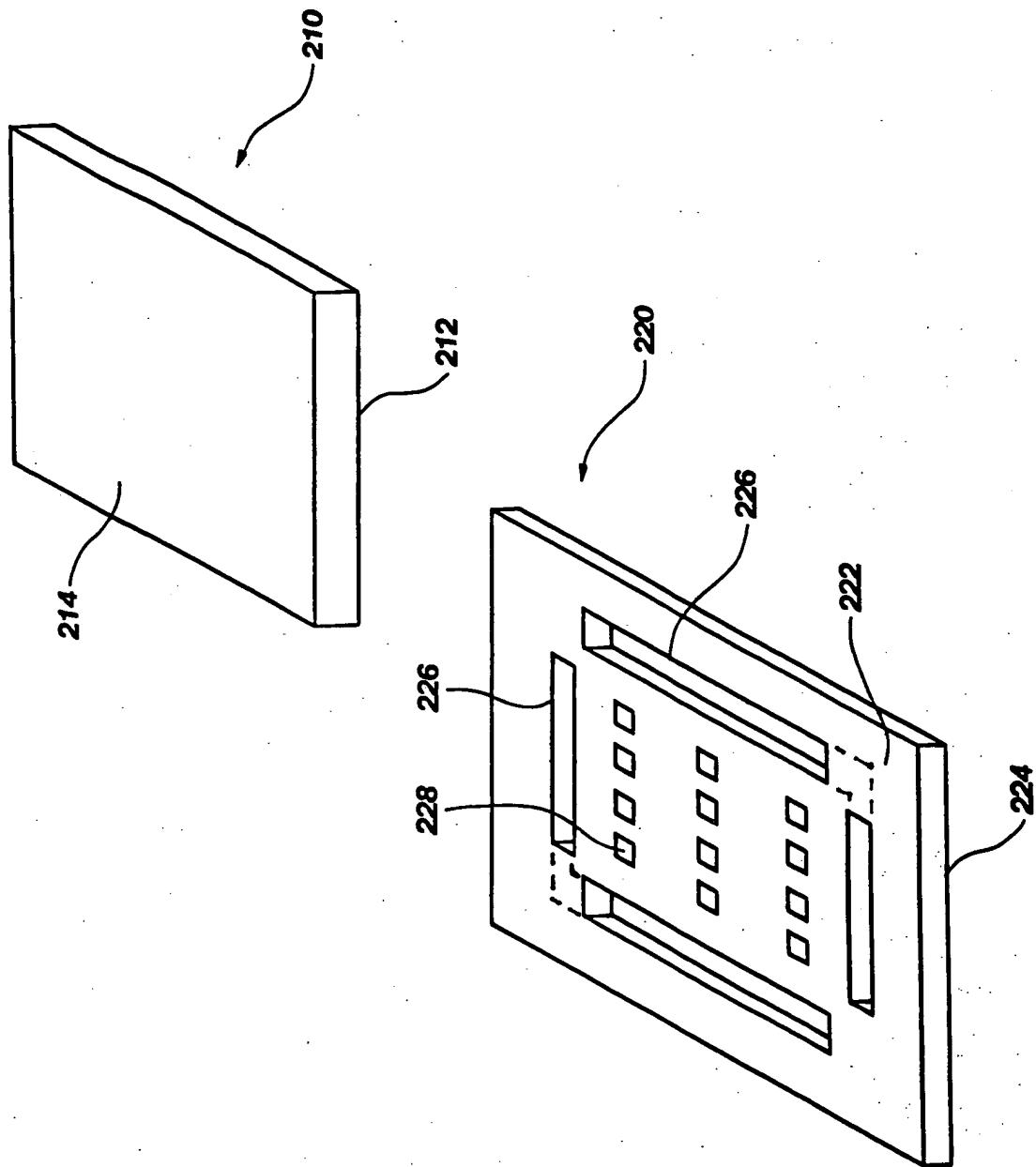


Fig. 6